Supporting Information

A Highly Selective Naphthalimide Based Ratiometric Fluorescence Probe for Recognition of Tyrosinase and Cellular Imaging

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Fig. S1: (A) Fluorescence excitation spectra of probe L3. (B) Fluorescence emission spectra of probe L3 in 10% ACN in PBS ($\lambda_{ex} = 425$ nm, $\lambda_{em} = 467$ nm).

Fig. S2: (A) Fluorescence response ($F_{535}/F_{467}$) of the probe at different pH. (B) Fluorescence stability study of the probe L3 on exposure to UV light at a different time interval.
Fig. S3: (A) Fluorescence response of probe in the presence of tyrosinase (150 U mL⁻¹) at different pH. (B) Effect of temperature on fluorescence response of probe in the presence of tyrosinase (150 U mL⁻¹).

Fig. S4: Fluorescence emission plot of probe L3 (10 μM) vs. reaction time (0-160 min.) at different concentration of tyrosinase (0- 150 U mL⁻¹). Experiments were performed at 37 °C in PBS (10% ACN pH 7.4) with λₑₓ = 425 nm.
Fig. S5: (A) Kinetic parameter study for the calculation of $K_m$. (B) Fluorescence emission spectra of Probe L3 in response to tyrosinase in 1:99 (v/v) DMSO/PBS.

Fig. S6: Mass spectra of L3 solution in the presence of tyrosinase. Peak correspondence to m/z at 317.14 indicate the breakage of carbamate linkage and release of free 4-aminonaphthalimide derivative (L2).
**Fig. S7:** (A) Fluorescence emission profile of probe at different reaction conditions. (B) Fluorescence intensity ratio of probe at $F_{535}/F_{467}$. (a) Probe (b) Probe + Tyrosinase (c) Probe + Tyrosinase + Kojic acid (100 μM) (d) Probe + Tyrosinase + Kojic acid (200 μM)

**Fig. S8:** Cytotoxicity Assay of Probe L3.
**Table. S1:** Fluorescence sensor for the detection of Tyrosinase with a different detection limit

<table>
<thead>
<tr>
<th>Method</th>
<th>Limit of Detection</th>
<th>Reference</th>
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<tbody>
<tr>
<td>Nanoclusters of gold</td>
<td>6 U L(^{-1})</td>
<td>1</td>
</tr>
<tr>
<td>RF-QDs-DA</td>
<td>10 U L(^{-1})</td>
<td>2</td>
</tr>
<tr>
<td>Cyanine</td>
<td>0.01 U mL(^{-1})</td>
<td>3</td>
</tr>
<tr>
<td>Pdots@Tyr-OMe</td>
<td>1.1 U L(^{-1})</td>
<td>2</td>
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<tr>
<td>Dopa-CQDs</td>
<td>17 U L(^{-1})</td>
<td>2</td>
</tr>
<tr>
<td>CDs-Tyr</td>
<td>10.2 U mL(^{-1})</td>
<td>4</td>
</tr>
<tr>
<td>Resofuran</td>
<td>0.04 U mL(^{-1})</td>
<td>5</td>
</tr>
<tr>
<td>Naph-L3</td>
<td>0.2 U mL(^{-1})</td>
<td>This work</td>
</tr>
</tbody>
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**Fig. S9:** \(^1\)HNMR of L2
**Fig. S10:** $^{13}$CNMR of L2

**Fig. S11:** $^1$HNMR of Probe L3
Fig. S12: $^{13}$CNMR of Probe L 3

Fig. S13: HRMS of Probe L3
References: